
Intermodal Transportation Systems

Prepared and Delivered by

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It's my pleasure to be here this morning to participate in the Second Weather Information for Surface Transportation Symposium. I was encouraged to listen to Sam's presentation and to hear of the progress that you've made over the last year, especially, with the work that has done together by the transportation and weather communities. Cooperative efforts are at the heart of what we are trying to do in the Department of Transportation in our Intelligent Transportation Systems (ITS) program--bringing together communities like this and merging them together into a single community.

I know that last year, Associate Deputy Secretary Steve Van Beek and Dr. Christine Johnson, who is now the Federal Highway Administration's Operations Core Business Unit Leader, talked to you about a vision for weather information in the transportation context for surface weather information. And clearly, you have made a lot of progress over the last year and we have made a lot of progress at the department with the intelligent transportation systems program. What I'd like to do this morning is deepen that vision a little bit and talk to you about how we can bring together ITS weather information and bring it together in an intermodal context.

I'd like to cover three points in my presentation this morning. These three points are:

- Our perspective of the evolution of the ITS program and the effort to include weather information--to describe how far we think we've come and where we still need to go, and where weather fits into that evolution.
- The concepts of integration and interoperability and inter-modalism because I think they are at the heart of the ITS program and should be at the heart of weather information for surface transportation.
- Then, maybe some examples of how we can take an intermodal approach to weather information.

I was pleased to hear this morning, when Sam started, that he spoke about what you're about in the context of the challenges that are before us from a transportation standpoint--because those are some of the reasons the Department of Transportation is investing in intelligent transportation systems. It is not about the technology--it's about solving transportation problems. And, there are some significant ones that face us.

In the United States, we have 41,000 people that die annually on the highway systems--not to mention six million crashes and three and a half million injuries annually. We have congestion that is significant already and forecast to rise by 50 percent over the next 10 years. At the same time, we have from an industry perspective an approach that is now based on *just in time delivery*. The idea that the warehouse is no longer a building--it is the truck traveling down the road. The idea is to move goods quickly from manufacturing directly to the point of retail distribution. It puts a lot more requirements on the transportation system to operate in that kind of manner. And, at the same time, we have environmental and other constraints that are pushing us to try to make public transportation systems more attractive--to draw people to use public transportation and to move away from individual use of the highway system.

So, these are the challenges that we are trying to face at the department; those are the challenges that you need to keep in mind as you look at framing weather requirements and weather needs. Solutions to some of these challenges or problems are the reasons people will invest money in better weather information. Now, I've mentioned our Intelligent Transportation Systems program and we believe that bringing the technology to transportation can be part of the solution. We don't pretend that it will be the solution to all the problems but we do believe it will be part of the solution.

The way we're trying to invest is through improving the intelligence of the highway and improving the intelligence of the vehicles that are traveling on the highway. It's a whole series of technologies that are invading your lives outside transportation--it's the computer; it's the global positioning system; it's a whole series of sensors; it's the wireless industry--that's just growing by leaps and bounds; it's in-vehicle computing--telematics. The ability to harness these technologies changes the way we think about transportation today, and the way we will think about it in the future. That's what intelligent transportation systems are about!

Now, this program we call ITS has been evolving--it started back in the 1960's. ITS originally started with investments made by the Department of Transportation and the Department of Defense, but it really didn't form until the late 1980's--until the group called *Mobility 2000* came together and said, "we need to do something about transportation" and "we need to leverage technology to do it". ITS was formulated in the Intermodal Surface Transportation Equity Act (ISTEA) of 1992. ISTEA legislation set up this vision for ITS, clearly made ITS part of the solution, and created public investment in ITS for the first time. In that ITS era--1992-1998, we put a lot of investment into understanding what the technology can do. We did a lot of research, we did operational testing, and demonstration of benefits to demonstrate that ITS was real.

Since 1998, when our highway program was re-authorized and ITS was re-authorized, we've had a much greater focus on accelerating deployment. We're trying to actually use these technologies to solve transportation problems. And, that's the era

we're in today; this era will last to 2003, when we'll undergo another re-authorization. But the whole goal--in the end--is a seamless transportation network. Being able to provide information that will allow people and goods to move easily between the various systems, basically, an intermodal approach to transportation.

As I mentioned, intelligent transportation systems have been around for nearly a decade and we've seen a lot of progress. If you've been watching the way vehicles are evolving, you would have noted a lot of emphasis on bringing information and technology into the vehicle--in-car navigation system, in-vehicle information systems, Internet in the vehicle. A lot is going on and these capabilities are just exploding. For example, the GM *ON-STAR* system is capable of automatically notifying someone in the event of a crash, basically, automatic collision notification. Just a few years ago, there were only 10,000 of these systems in vehicles. This year, GM is expecting to have *ON STAR* in a million vehicles and, within 2-3 years, their goal is 5 million vehicles equipped with *ON-STAR*. Having that capability in the vehicle enables us to do a lot more in terms of communicating with drivers. In-vehicle technologies enable communication of a whole series of information to drivers--not the least is weather information.

So, I think the time is right for this kind of meeting and these kinds of discussions. This meeting is an opportunity to deal with weather information requirements and to frame these requirements in such a way that they proactively address needs and challenges that exist in our transportation system.

When we talk about intelligent transportation, we try to talk about it founded upon three basic principles: Integration, interoperability, and intermodalism. The principle of integration means we want to have systems that connect to one another and are able to talk to one another. The principle of interoperability represents the capability to talk the same language and to connect easily with one another. And lastly, the principle of intermodalism enables us to work in an intermodal context--where we're able to move and work across the various modes easily and in an unencumbered manner. We look upon intelligent transportation as a system not just of highways and transit; but rather we look at ITS collectively as a system of transportation.

The key to this integration and interoperability from our perspective is the national ITS architecture. The ITS architecture was an early investment by the Department of Transportation and a wise one, I think, because what it does is provide a structure for communications between travelers and vehicles and the roadside and centers. And, it frames that out in a way that provides a clear vision on how these information flows can come together and how these various systems can talk to one another. The architecture lays out some requirements and frames some of the thinking at the state and local level and it does it in the intermodal context that I've been talking about this morning.

If you haven't been exposed to the architecture, if you aren't aware of it, I encourage you to invest some time in it. There are a whole variety of things available

from the department to aid you in learning about the ITS Architecture. We have a training course that is available; we have the architecture itself available on a CD; we have a software tool called 'turbo-architecture'--much like *TurboTax*--to help lead you through the steps. We even have a 1-day, web-based training course that the University of Maryland has put together for us. This really is the future and the way we think about intelligent transportation systems and the way weather information will come into ITS. So, I encourage you to invest some of your time in understanding the national ITS architecture.

My office, the ITS Joint Program Office, is founded on the idea of intermodal coordination--that's why we were set up. We're unique within the department in that we have responsibility for the ITS budget across all the modes. We have the planning and the directional authority for the program because when the ITS program was set up, they felt it was so important to go about it in an intermodal context, and in a system context, that they set up the joint program office to do so. And, I think we can assist you as you move forward with incorporating weather information into transportation.

Now, as we would look at the weather information, clearly there are some areas where weather is unique to modes--where it is separate by modes. And we don't pretend that all weather information, all activities are intermodal. But there are many weather threats that are common across the modes. And that's where I think you can really leverage the bringing together of the players from those different modes. I think when you move forward with your requirements and you move forward with your thinking if you do so in a manner that when you're collecting data, when you're formatting data, when trying to make it available you do it in an intermodal context it will help you tremendously in terms of building a market for weather information within the surface transportation community. You're not going to build that market piece-by-piece, mode-by-mode. The way you're going to build that market and you're going to get investment is if you look at it as a system and you create it as a system.

I think looking at it from that perspective will allow you to bring up surface transportation or land information weather information on par with aviation and on par with maritime. Clearly, when you look at the challenges before us, in terms of the safety problem we have, when you look at it economically, I think there is no question that surface and land information ought to be a lead if not the lead investment from a weather standpoint. It is so vital to our economic basis in this country that it is a little surprising that we haven't recognized it earlier. But now that we've recognized it is clearly time to invest in that part of the weather information system but you need to do it in this intermodal context if you're going to build that constituency.

What I'd like to talk for a minute about are a couple of opportunities that I see on the horizon for thinking about weather in this intermodal context. One that is more people-oriented and one that is more goods-oriented. I was very pleased to see that 511 is on your agenda at tomorrow's lunch. I too think that it is a landmark achievement and one that you can really leverage on as you move forward with weather requirements.

For those of you who are not familiar with it, 511 is a 3-digit number that was allocated to the department in response to a petition that we made to the FCC; that allocation happened this summer in July. The way it would work essentially is just like 411 when you dial for directory assistance. Anywhere in the country you can dial 411 and you can get information about the phone number that you are looking for. The idea behind 511 is similar that anywhere in the country you can dial 511 and get information about the local traffic conditions, transportation conditions on the highways, rail, and bus system in that area. So it is meant to be an intermodal number where you can get real-time travel information.

Currently, we are working with a consortium that is being formed and lead by the American Association of State Highway and Transportation Officials (AASHTO). The consortium includes players from the various modes and their task is to figure out how to take this valuable resource and get it implemented on the state and local level. Local numbers are not likely to be used much but if there is just one number, then the use should increase.

At present, there are 300 local numbers that need to be converted to 511. As a means to convert these numbers, we are going to have a solicitation come out this year for a 511-model deployment. Because we not only want to convert the existing numbers, we really want to push the thinking about how we can take this resource and really use it to the maximum extent. That's where there is an opportunity for the weather community to make sure they're part of the model deployment and to make sure that as we frame out what is the potential for 511, we really consider, explore, and demonstrate how weather can be used in the 511 context and really enrich what is already being done with traveler information.

Just to show you an example, probably the leading, existing traveler information number and one of our lead adopters is the SF bay area. Currently, they provide traffic information, transit carpools information, about parking, biking,--out there to a 9 county area. What they have tried to do to bridge the gap in the absence of 511 is to get the same phone number available in each of the six area codes that cover those 9 counties. They are very excited about having 511 and creating that single number within that area. You can see the approach they're taking is very much an intermodal approach and it fits very well with what you're about in terms of weather information systems.

The second example I want to give to you is more of a goods example. Another community that we're working more closely with at the department is the freight community. And we are looking at the transport of goods in an end-to-end manner. What I mean by that is to look at it as the goods are arriving at a port in the US aboard a ship, looking as those goods are transferred onto truck or rail moving across the system trying to get to distribution or directly to retail centers trying to look at how we can work collectively both industry and government to make that whole system much more efficient. It relies on a lot of coordination along with a lot of producers and shippers; it depends on the whole idea of "just in time delivery"; and, clearly, when

you're going to move goods across this country weather is a significant player in that whole process. All of the modes in the supply chain will rely upon weather information if we are going to improve the efficiency. So again, when you look at what you're about look at it in the context of people, but also look at it in the context of freight and goods because the impact of weather is strong in both arenas.

I guess some of the challenges that we have before us and that you have before you are that the institutional structures are not conducive to this intermodal approach. As much as we are trying to bring that approach to what we do at the department and the way we deal with intermodal and intelligent transportation systems, it is a day-to-day challenge to think intermodally for each of us. Most agencies are very much structured along the traditional highway, transit, and rail structures. Even the United States Congress, in the way their committees or subcommittees are set up in the transportation area in the same way. It builds that constituency from the very beginning when the budgets are created. And when we look at operation, which is at the heart of weather, there a lot of split, and it is not that easy to split them but it is essential to do so.

The same with the metropolitan planning organizations that do a good job of thinking intermodally from a planning context; unfortunately it doesn't work so well from an operations context. So you have some challenges before you in terms of trying to think intermodally and to deal with the agency that you have to deal with in an intermodal context.

But I also think that ITS is bringing some opportunities to that. Because ITS is forcing transportation agencies to think and act intermodally. The technology does not recognize the boundaries of modes and, as they are being deployed, people are thinking much more intermodally when deploying those systems. We are also taking steps at the federal level to require more intermodal thinking on the part of state and locals and that is through architecture consistency. We have a federal rule which we plan to issue at the end of this year that will require ITS systems to be part of the transportation planning and operations process at the state and local level. We think that will go a long way into changing this mindset from a modal and from a non-technology mindset to an ITS mindset in an intermodal context. And that's why I recommend to you that you get knowledgeable about the architecture because this rule will push the community.

We also are taking an operations focus through the work that Dr. Christine Johnson is doing within the FHWA. She is very much pushing operations as the way or the major part of the business of transportation. And I think that also helps you as you try to bring weather information systems to surface transportation.

As you move forward, and as you look at your next steps, I think you need to look at it from both a technology side and from the institutional transportation improvement side. By that I mean, certainly we need to collectively invest in the technology in the observing systems that will allow us to get the kind of information necessary to warrant investment. And that includes environmental sensing stations, it includes looking at

differential GPS and its ability to sense water vapor information, it includes our work at looking at the national highway system and creating not only an infrastructure but also an info structure that will support the communication of weather information to travelers. So you need to work on the technology side with us as we move forward. But we also need to look at how we motivate people to use that weather information and invest in that weather information. And I think the way we motivate them is by thinking in an intermodal context, it's by looking at it from their perspective from what are the transportation challenges that they're trying to solve and putting weather information in the context of those transportation challenges. That's the way you'll get them motivated and the way you'll get their investment into transportation.

So in closing, let me say I think what you're about is the right thing to be about. And that is to bring two communities together—the weather community and the transportation community. As you do that, what I've tried to do in this presentation is challenge you to think intermodally. Work with us at the department and within the Intelligent Transportation System Program because I think ITS will be the enabler by which you will bring weather information systems into the transportation community. I think you have a great agenda, I commend those who put together the agenda, and I wish you well as you work together over the next several days and over the next several years to move weather information systems forward. Thank you very much.

Link to Presentation:

www.ofcm.gov/WistII/Presentations/Day1/2_Intermodal_Trans/JeffPWISTIIspeech.ppt